

The Sustainability Outlook: A Summary

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Contents

| | |
|---|----------|
| Acronyms and Abbreviations | ii |
| The Sustainability Outlook: A Summary | 1 |
| Managing Adaptively for Sustainability | 1 |
| Guiding Principles for Aligning Water Management with the Societal Values | 5 |
| Developing the Sustainability Outlook | 5 |
| Sustainability Outlook Methodology | 6 |
| Piloting the Sustainability Outlook | 6 |
| Sustainable Water Management Profile..... | 7 |
| Russian River Watershed Pilot | 7 |
| Santa Ana Watershed Pilot | 7 |
| Moving Forward to 2023 and Beyond | 7 |
| References..... | 8 |

Table

| | |
|---|----------|
| Table 1 Preliminary Indicators for Reporting on Intended Outcomes..... | 3 |
|---|----------|

Figure

| | |
|---|----------|
| Figure 1 Managing Adaptively for Sustainability..... | 2 |
|---|----------|

Acronyms and Abbreviations

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|-------------|--|
| DWR | California Department of Water Resources |
| OWOW | One Water One Watershed |
| SAWPA | Sant Ana Watershed Project Authority |
| SWM Profile | Sustainability Water Management Profile |
| Update 2013 | California Water Plan Update 2013 |
| Update 2018 | California Water Plan Update 2018 |

The Sustainability Outlook: A Summary

Whether making water resource decisions or taking action, aligning desirable outcomes with four societal values — public health and safety, healthy economy, ecosystem vitality, and enriching experiences — is critical to managing water for sustainability. It can be as simple as being mindful of not wasting water, and as complex as predicting and planning for the next drought or flood. Daily, every Californian is responsible for doing their part. But how will Californians know whether their actions are moving the state in the right direction?

One basic long-standing challenge to water resource resilience and reliability in California is the lack of a consistent and practical method for assessing current and future sustainability (California Department of Water Resources, in prep.). Productive planning and the setting of policy priorities require a mutual understanding of challenges, resource limitations, management deficiencies, and shared intent. Managing for sustainability must be rooted in what Californians value, as expressed by stakeholders and corroborated by extensive outreach. Accordingly, there is a need to identify, through the lens of the four societal values, desirable water management outcomes (intended outcomes) and indicators to track status and progress toward sustainability.

The Sustainability Outlook, described in this document, provides a well-organized and consistent approach for tracking local, regional, and State actions and investments. It will also assist in setting future water management priorities. When applied at a watershed scale, the Sustainability Outlook can increase the effectiveness of State water policies and return on investments. Conducting and reporting watershed conditions will more clearly reveal trends, progress, and return on investment that would be difficult to discern at a statewide scale. Watershed evaluations will also allow for the introduction of additional indicators important to specific regions of the state. Through progressive application of the Sustainability Outlook, decision-makers will be able to identify needed analytical tools and data gaps, expand on the information available to make decisions, and build a common understanding of how individual and collective actions have affected the management of water resources for sustainability.

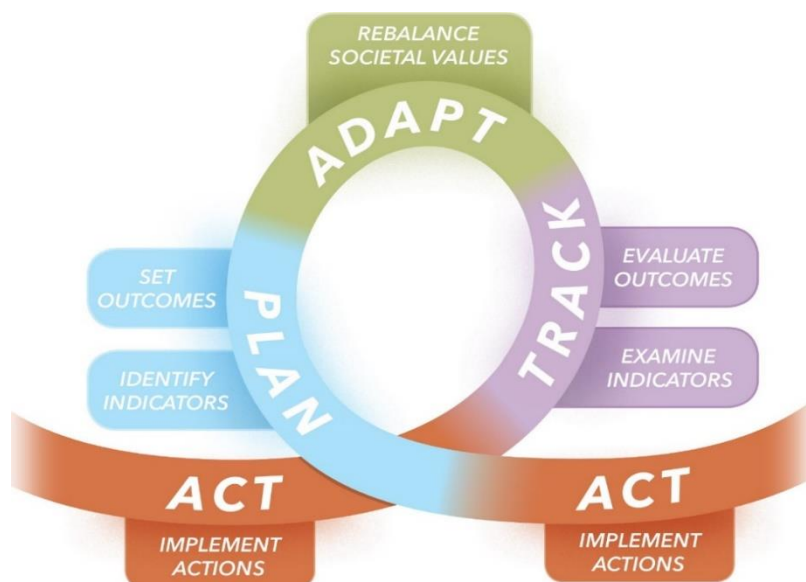
Because sustainability is not something achieved once and forever, the Sustainability Outlook will help water resource managers adapt to changing circumstances and lessons learned. This document underscores the urgency and rationale for the recommended actions in *California Water Plan Update 2018* (Update 2018), Chapter 3, “Actions for Sustainability,” as well as the importance of follow-through by those who would implement those actions.”

Managing Adaptively for Sustainability

The Sustainability Outlook is an evolving method of informing the strategic planning and prioritization of water management actions (e.g., regulations, policies, projects) and investments. This method, or tool, involves evaluating status and trends of conditions within a watershed or region, setting intended outcomes consistent with the four societal values, and determining whether actual outcomes are consistent with intended outcomes. Vital to effective application of the Sustainability Outlook is the consistent and comprehensive approach to data collection, organization, and standardization that enables water managers to evaluate status, trends, and outcomes. These evaluations are then used to periodically adjust intended outcomes and reprioritize actions and investments. Ultimately, this management cycle results in shared

understanding of water resource challenges and needed actions along the path toward sustainability (Figure 1).

Figure 1 Managing Adaptively for Sustainability



The Sustainability Outlook is organized such that each societal value is elaborated on by a list of intended outcomes. Each outcome is accompanied by preliminary indicators that help determine whether the outcome is achieved (Table 1). These values, outcomes, and indicators were informed by multiple entities and stakeholders, and will be used to track the effectiveness of the actions recommended in Chapter 3. This document describes efforts to pilot the Sustainability Outlook at a regional scale as a precursor for applying the method, over time, in individual watersheds throughout California.

Table 1 Preliminary Indicators for Reporting on Intended Outcomes

| Societal Value | Indicator |
|--------------------------|---|
| Public Health and Safety | Intended Outcome — A reliable water supply for domestic needs, sanitation, and fire suppression. |
| | PHS 1 Population and Percentage of Population with Reliable Domestic Water Supplies |
| | PHS 2 Population and Percentage of Population without Access to Reliable Sanitation |
| | Intended Outcome — Reduced number of people exposed to waterborne health threats such as contaminants or infectious agents. |
| | PHS 3 Number of Public Water Systems Not in Compliance with Drinking Water Standards |
| | PHS 4 Percentage of Beaches with Safe Coliform Bacteria Levels |
| | PHS 5 Water Supplies Derived from 303(d) Impaired Water Bodies |
| | PHS 6 Potential for Consumption of Mercury-Contaminated Fish |
| | Intended Outcome — Reduced loss of life, injuries and health risks caused from extreme hydrologic conditions, catastrophic events and/or system failures (including infrastructure). |
| | PHS 7 Population Served by Local Hazard Mitigation Plans, Emergency Response Plans, or Equivalents |
| Ecosystem Vitality | PHS 8 Population Covered by Water Shortage Contingency Plans |
| | PHS 9 Urban Population without State-Mandated Urban Level of Flood Protection |
| | PHS 10 Population in Floodplains with Equal to or Greater than a 1 Percent Chance of Flooding in any Given Year |
| | Intended Outcome — Maintained and increased ecosystem and native species distributions in California while sustaining and enhancing species abundance and richness. |
| | EV 1 Native Fish Conservation Status and Community Diversity Index |
| | EV 2 Non-Native Invasive Species Distribution and Status |
| | Intended Outcome — Maintained and improved ecological functions and processes vital for sustaining ecosystems in California. |
| | EV 3 Acreage of Wetlands |
| | EV 4 Degree of Aquatic Fragmentation |
| | EV 5 Impaired Water Bodies – by Hydrologic Region |
| | EV 6 California Stream Condition Index |
| | Intended Outcome — Achieved designated beneficial uses for water bodies throughout the state. |
| | EV 7 Impaired Water Bodies – Count by Watershed |
| | EV 8 Number of Harmful Algae Blooms |

| Societal Value | Indicator |
|---|---|
| Healthy Economy | Intended Outcome — Reliable water supplies of suitable quality for a variety of productive uses, and productive water uses are based on a reliable supply. |
| | HE 1 Delivery Reliability of SWP, CVP, and Colorado River Aqueduct Systems |
| | HE 2 Comparison of Actual Water use to Proposed Statewide Water Use Targets |
| | HE 3 Distribution System Leaks and Losses |
| | HE 4 Groundwater Basins with Stable or Recovering Groundwater Levels |
| | HE 5 Groundwater Extraction Rates and Subsidence Rates |
| | HE 6 Change in Groundwater Storage |
| | HE 7 Percentage of Groundwater Basin Areas in Compliance with SGMA |
| | HE 8 Contaminated Groundwater Wells |
| | Intended Outcome – Consideration of economic risks and rewards on floodplains, rivers, and coastal areas. |
| | HE 9 Socioeconomic Vulnerability to Sea Level Rise Impacts |
| | HE 10 Areas Covered by Local Coastal Program Vulnerability Assessments Updated for Sea Level Rise |
| | Intended Outcome — More benefits from economics activities, including from reduced costs to provide a given level of service (including transaction and permitting costs). |
| Opportunities for Enriching Experiences | HE 11 Regional Trend in Cost of Water for Municipal and Industrial, Agricultural, and Other Purposes; Cost Compared to State Average for these Same Supplies |
| | HE 12 Volume of Water Transferred on the Open Market; Cost of Water on the Transfer Market |
| | HE 13 Percent of Average Annual Power Demand Satisfied by Hydropower |
| | Intended Outcome — Reduced likelihood or occurrence of significant social disruption following a disaster. |
| | HE 14 Value of Assets within Floodplains with Equal to or Greater than a 1 Percent Chance of Flooding in any Given Year |
| | Intended Outcome — Preserved or enhanced culturally or historically significant sites and communities, including continued and enhanced access to water and land used for sacred ceremonies or cultural practices. |
| | OEE 1 Number of Historically and Culturally Significant Sites at Risk of Flooding or Sea Level Rise |
| | Intended Outcome — Preserved and increased natural areas with aesthetic or intrinsic value (including view shed). |
| | OEE 2 Change in Natural Area |
| | Intended Outcome — Continued and enhanced access to resources that support education and learning. |
| | OEE 3 Number of School Districts Using Water and Environmental Curriculum in K through 12 Programs |
| | OEE 4 Number of Students Enrolled in Water and Environmental Resources Management Programs within the UC and CSU Systems |
| | OEE 5 Number of Water Agencies that Have Educational Programs for Customers |
| | Intended Outcome — Continued and enhanced recreational opportunities in waterways, reservoirs, or natural and open spaces. |
| | OEE 6 Change in Visitor Days at Water Related Park Lands |

Notes: CSU = California State University, CVP = Central Valley Project, EV = Ecosystem Vitality, HE = Healthy Economy, K = kindergarten, OEE = Opportunities for Enriching Experiences, PHS = Public Health and Safety, SGMA = Sustainable Groundwater Management Act, SWP = State Water Project, UC = University of California

Guiding Principles for Aligning Water Management with the Societal Values

As presented in *California Water Plan Update 2013* (Update 2013), the guiding principles listed below describe how water, land, and resource managers can progressively align projects, programs, and other actions with the societal values, and better utilize the Sustainability Outlook to make decisions and conduct business. These principles support effective planning by fostering trust through integrity, accuracy, transparency, and proper use of information in decision-making.

- Manage California's water resources and management systems through an ongoing, resilient, and dynamic balance of the four societal values.
- Apply California's longstanding principles of reasonable use and public trust as the foundation for public policy-making, planning, and management decisions regarding California water resources.
- Promote environmental justice — the fair and equal treatment of people of all races, cultures, and incomes.
- Help establish shared intent for sustainability with a long-view perspective for water resources management.
- Strengthen partnerships and help enhance governance to improve and align at all levels of government for effective, integrated water resource management.
- Promote regional planning and resource management at the most appropriate scale to increase regional self-reliance and effectiveness, and to acknowledge each region's unique perspectives, needs, and priorities.
- Acknowledge future variability, risk, and uncertainties, and cultivate learning and adaptation in the decision-making process.
- Use science, best data, and local and traditional ecological knowledge in a transparent and documented process.
- Invest with a long-term view toward adequate and predictable public funding to increase system flexibility and resiliency.

Developing the Sustainability Outlook

The Sustainability Outlook builds on existing and ongoing sustainability measurement efforts in the state and nationwide. These efforts include sustainability assessments conducted by the California Department of Water Resources (DWR) as part of Update 2013 and DWR's Statewide Flood Planning Program; watershed sustainability efforts by the State Water Resources Control Board; work by the California Department of Fish and Wildlife as part of the *California State Wildlife Action Plan*; and work by other State agencies, non-governmental organizations, and academic institutions. DWR reviewed existing sustainability efforts and conducted numerous meetings and workshops with State agencies and the public to solicit input and feedback. This included identifying and proposing draft water-related outcomes tied to the four societal values; identifying potential data sources and information that could be used to assess sustainability; and considering different scales of application, from watershed to statewide.

During the Sustainability Outlook development process, DWR explored various methodologies. Feedback from subject experts and stakeholders helped set the vision and determine the application of the Sustainability Outlook. As a result, the following success criteria were identified as foundational to the Sustainability Outlook:

- Easily understood, to facilitate wide and timely adoption.
- Flexible, to allow for different conditions, issues, and scales.

- Versatile, to allow managing for changing conditions and emerging challenges.
- Coordinated, to maximize relevance and avoid duplication of effort.
- Adaptable, to accommodate varying availability or accessibility of data.
- Repeatable, to enable long-term tracking of indicators.

A detailed description of DWR’s process for developing the Sustainability Outlook — where it comes from, where it stands, and where it is going — is included in *Sustainability Outlook Indicator Descriptions and Methodology* (Stantec 2018).

Sustainability Outlook Methodology

The Sustainability Outlook uses data (indicators) to help assess progress in achieving desired results (intended outcomes) aligned with the societal values listed in Table 1.

Intended outcomes articulate the desired results from managing California’s water resources in a manner consistent with the four societal values. For example, the intended outcomes related to ecosystem vitality consider three important facets of a healthy and sustainable ecosystem: abundance, natural processes, and beneficial uses of water in the environment. Ensuring reliable water supplies, cost-sharing for multi-benefit projects, and preparing effectively for potential disasters help safeguard the health of California’s economy. At the same time, public health and safety must be a primary consideration in all decisions, actions, projects, and programs. The outcomes related to the societal value of enriching experiences consider the human relationship to water — in homes, communities, and the environment. The outcomes resulting from the interrelated and grounding qualities of these values are considered long term and may change over time. For example, an outcome related to ecosystem vitality could continue to evolve as our understanding of ecological systems and the processes that sustain healthy ecosystems grows.

Indicators are the data and information (metrics) used to measure the progress in achieving the intended outcomes at a given point in time. Although large volumes of data are being collected throughout the state, not all data are relevant to decision-making in all regions. Nor is it practical or necessary to use all available data to assess water management sustainability. For these reasons, the Sustainability Outlook identifies a manageable set of indicators that apply statewide and can be used to conduct watershed-scale sustainability assessments.

Applied at a statewide scale, indicators are intended to be broad and cover conditions in diverse areas (e.g., coastal and inland areas, rural areas and urban centers). At a watershed scale, indicators measure what is relevant to a specific area, which may or may not be the same as what is relevant on a statewide scale. Indicators may change as the ability to collect and interpret data changes, the conditions in the state and watersheds change, or the understanding of intended outcomes evolves.

Piloting the Sustainability Outlook

DWR is actively engaged in ongoing and upcoming pilot programs that demonstrate how the Sustainability Outlook can be applied at a watershed scale. DWR has entered into partnerships with California Forward, Pacific Institute, Water Foundation, and Santa Ana Watershed Project Authority (SAWPA) to conduct two watershed-scale pilot projects for the Sustainability Outlook, which will identify multi-benefit investment strategies and indicate progress toward sustainability. DWR is also working with the Water Foundation to incorporate lessons learned from the foundation’s recently

completed Sustainability Water Management Profile (SWM Profile) into those two pilots. Each pilot study was initiated with the preliminary indicators, described in *Sustainability Outlook Indicator Descriptions and Methodology* (Stantec 2018), to measure the progress and effectiveness of recommended actions for water resource sustainability (see Table 1).

Sustainable Water Management Profile

In 2016, the Water Foundation partnered with the Inland Empire Utilities Agency to guide development of a SWM Profile, a mechanism to drive continual improvement toward long-term supply resilience and water resource stewardship at a regional (or watershed) scale in California. This pilot SWM Profile evaluated how the water agency was performing by examining the water supplies upon which it directly or indirectly relied. Using simple metrics, the SWM Profile identified the vulnerability of its water systems to “key stressors” (e.g., risks or threats) in the categories of environment, supply, demand, and finance. The SWM Profile also evaluated actions taken by the water agency and the broader region in response to the stressors.

Russian River Watershed Pilot

The Russian River watershed was selected as a pilot area because of established collaborative relationships. As planned, this pilot is applying the outcome-based planning concepts advanced by Update 2018 at a watershed scale. Work is being performed in alignment with California Forward’s and Sonoma County Water Agency’s sustainability planning to:

- Define sustainability outcomes and metrics.
- Align regulatory processes to achieve sustainable outcomes.
- Improve governance and implementation efficiency.
- Identify funding and finance options.

Santa Ana Watershed Pilot

The Santa Ana River watershed was selected as a pilot area because of established relationships, as well as the innovative sustainability planning of the *One Water One Watershed* plans coordinated by SAWPA. The *One Water One Watershed 2.0 Plan* (2014) created an indicators-based tool for evaluating IRWM plan performance. (The tool is based on earlier DWR grant-supported work at the Council for Watershed Health and Update 2013 work at University of California, Davis.) This pilot draws from the earlier work and the experience in the region with application of the Water Foundation’s SWM Profile. The pilot results will further integrate and prove the value of using the Sustainability Outlook as the basis for understanding progress toward stakeholder-developed watershed goals to serve regional decision-making.

Moving Forward to 2023 and Beyond

DWR recognizes that most of the work to advance managing water resources for sustainability will be led by regional and local entities, with incentives from the State. Progress on the Sustainability Outlook pilot projects will be in the Update 2018 supporting documentation. Subsequent results of the pilots will be used to test and refine the indicators, as well as the overall Sustainability Outlook approach. DWR will strengthen collaboration with other regional water management groups and partners to develop appropriately scaled watershed sustainability outlooks throughout the state. Planning at a watershed scale can help water managers evaluate and consider the interdependencies among physical, biological, economic, and social processes, from headwaters to outlets, as well as interbasin interactions. It is

anticipated that watershed sustainability outlooks will be included in California Water Plan Update 2023 to describe conditions, support statewide planning, and inform State investment priorities.

As they become available, additional data and information will be iteratively incorporated into the Sustainability Outlook to evaluate trends and assess current and future sustainability.

References

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